Impact of Capital Adequacy on Risk and Performance:

Evidence from Banking Sector of Pakistan

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Abstract

The main objective of this study is to investigate the impact of capital adequacy ratio on risk, performance and quality management in Pakistan both in commercial and Islamic banking sector. We used panel data from 2000 to 2019 in annual frequency. Data was comprised of 10 commercial and 11 Islamic largest banks of Pakistan. Many of the previous studies was based on either Islamic or conventional banks. Rare of the study has been conducted for checking their mutual relationship in case of Pakistan. This study based on the conventional commercial and Islamic banks in Pakistan affected by capital adequacy ratio upon risk, performance and Quality management. Study concluded that the impact of capital adequacy ratio and risk is negative and significant which indicates that in commercial banks, increase in bank's capitalization ratio will decreases the bank risk taking. Moreover, capital adequacy ratio and size have a negative impact on performance of banks. Quality management is positively associated with capital adequacy ratio which means that an increase in the capital adequacy ratio will increase the efficiency of the banks. Size is also significant in the risk equation which indicates that more the assets bank have more they able to manage their risk. Thus, large banks have more opportunities in managing risk levels through diversification.

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Chapter # 1

Introduction

Especially in developing countries financial crises are one of the most immediate and important issues for the banking sector globally. Remarkable financial crises have been witnessed in numerous countries over the past few years. Resulting in financial crises and financial market instability the latest financial crises were faced in the US subprime mortgages due to the financial credit crunch that occurred in 2007 and 2008. In East Asia the developing countries have suffered the financial crises in the form of a significant outflow of foreign investment earlier in 1997. Monetary crises are highly marked by the ascent of non-performing loans (NPLs) in banking advances. After the global crises, NPLs are mainly under the eyes of government and banking management since they are considered with the failure and crises of the banking system. This phenomenon is most crucial to countries that highly rely on banks as monetary intermediaries that assign funds throughout the country's economy. In banking-centered economic system, banks play a key part in the sustainability of the banking system and are known as the primary source of funding, as the capital markets of these countries are still emerging (Khan 2020).

On minimum capital requirements, the financial crisis of 2008-09 affected large number of banks globally which forced Basel Committee on Banking Supervision (BCBS) to come up with Basel-III norms and revising their prevailing norms. From the risk of letdown of financial system and bankruptcy, the recent financial crisis has brought up numerous issues about the protection of financial institutions. To achieve the economic growth and prosperity the primary focus of conventional financial system is to increase the risk adjusted rate of returns. To share the risk and profit among all the involved parties it is the primary focus of Islamic financial system. For the protection and avoid the global financial system failure due to the financial crisis the policymakers of different central banks started thinking about to

impose different restrictions on financial institutions. Poor risk management which leads to portfolios of poor-quality loans and high liquidity risks was the reason of the financial crisis. For the strengthening of the system the Basel committee issued more regulations regarding the capital framework of financial institutions. To promote the stability and soundness of financial systems due to which they will ultimately achieve the economic growth was the basic purpose of Basel Accord 2 and 3 (Ayub & Javed, 2015).

In recent years, financial institutions have faced a vibrant, competitive, and fast-paced situation at national and international level. One of the most mounting dimensions is the new prototype of Islamic Banking, which has amazingly attracted the attention of both Islamic and conventional economists. Today Islamic banks are operating in all areas of the globe, and are appeared as a practical and feasible alternative system, which has numerous things to present. Though it was originally developed to accomplish the requirements of Muslims, at present Islamic banking has currently achieved worldwide acceptance. Islamic banking is documented as one of the greatest rising areas in finance and banking. Despite the fact that the majority of Islamic Banks were established within the promising and/or Middle East states, many banks in developed countries have started to value the enormous demand for financial products of Islamic Banks (Sufian, 2007).

The Islamic banking system has indeed been attracting the attention of researchers, customers, and policymakers. Yet, conventional financial system is still dominating around the globe. Islamic banks have to compete with conventional counterparts in standardization, innovation, intra and inter industry business, and markets to operate in the dual system. Despite these challenges, many countries have adopted the Islamic banking model owing to the inherent characteristics viewed through real and transparent economic transactions that are free form interest, uncertainty, and gambling, as well as are asset backed (Belouafi & Chachi, 2015). Since Islamic banking system is emerging in the financial markets, it has to

come across a number of challenges in showing noticeable performance in competitive environment.

1.1 Impact of Capital Adequacy on Risk and Performance

To maintain themselves Capital Adequacy is the minimum amount of reserves that are required for any organization. In banking security Capital adequacy plays a major role. To invest in the bank, it also represents a bank's image, potentially attracting public confidence and there is a solid public relations characteristic to capital adequacy. The readiness of capital is a perfect sign of health of a bank and a satisfactory situation to guarantee the safeguarding of certainty by investors, creditors and depositors it is commonly accepted. Macroeconomic performance significantly affected by Banking performance, so, changes in level of gross domestic product (GDP) will affect level of capital adequacy ratio. Inadequate internal control systems can lead to large losses by fraud, or losses could be made on the trading of foreign exchange and other types of financial instruments these types of risks which are not recognized by capital adequacy ratios. Since borrower's ability to repay the loan may decrease banks will conduct strict policies in lending activity. Banking institution is now securing more percentage in CAR as fall in GDP result to increase in capital adequacy ratio (CAR) (Yahaya et al, 2016).

The amount of a bank's regulatory capital expressed as a percentage of its risk-weighted assets which is a measure of the capital strength of a bank is the capital adequacy ratio. Bank's capital adequacy determined by three main elements that is (credit risk associated with exposures, market risk arising from banking activities and quality of capital held to support these exposures) prudential guidelines on 'Capital Adequacy'. To absorb any shocks that the bank may experience Capital adequacy helps bankers and regulators. Reducing the number of bank failures and losses to depositor's capital plays an important role. For reducing different risk components in banking industry, and it is necessary to reduce

moral hazard and competitiveness Capital adequacy plays a crucial role. Furthermore, to provide funds for its internal needs and for expansion as well as ensure security for depositor's banks must have enough capital (Pradhan and Parajuli, 2017).

The dynamism and competitivity of contemporary markets increase such risk. Various strategies have been designed by businesses to mitigate risk, but a dynamic market increases the possibility of both losses and gains which determine the success of an enterprise. From the corporate finance perspective, a risk is an unplanned event which causes a loss, or increases the potential for a future loss. In the world of financial intermediation, risk is a key consideration. The receipt of deposits and loan advancement contracts are essential elements of any business agreement, and serve to manage various risk factors: liquidity, credit-worthiness, and operational and market-based risks. A decade ago, the global financial crisis (GFC) exposed critical shortcomings in risk management by the international banking sector that led to financial disaster on a world-wide scale. This in turn has created a sense of urgency in the banking industry to reshape and redesign risk management practice (RMP) (Bade et al., 2011). The old models of risk management are increasingly discredited owing to their general lack of an integrated approach. The GFC adversely affected mega portfolio investment in America, Europe the Middle East. In consequence, regulatory authorities across the world economy and financial system have recommended that certain businesses establish the role of Chief Risk Officer to address this issue (Waqas and Bahrain, 2019).

To undermine public confidence in the system and leads to sudden contraction in money supply and investment, the soundness of banking system is important. To the efficiency and effectiveness of the working of the economy the aim of ensuring capital adequacy and soundness of banks is paramount. Capitally inadequacy is one type of a weak banking sector and become a risk for the sustainability (short and long term) of the economy but can be a major source of financial crisis which can result to macroeconomic crisis.

Determining bank performance other risks involved in financial transitions must be relevant. To judge a bank's financial soundness capital adequacy ratios are only as good as the information on which they are based and should not be interpreted as the only indicators necessary (Ikue-John and Nkoro, 2019).

Competition, more depositors, low fund costs, risk in portfolio interest, high return on equity, less distress incidences, profit maximization, avoidance of bankrupt and their negative externalities on the financial system and incentive to increase risky assets these factors that may affect bank's capital. These factors are strongly affecting the capital adequacy on bank's performance and the regulatory body prevailing in the country. Some variables must be considered determining bank's performance in relation with its capital adequacy. Bank's managerial quality and productive efficiency strongly affected by the degree of competition in the industry. Bank's capital is effectively managed, determines how adequate the capital is? It is ensured by the ability of the bank management. Capital adequacy ratios is concerned primarily with credit risks according to the Basle Capital Accord if the capital adequacy ratios above the minimum levels, then there is not any guarantee "safety" of a bank (Moses & Umoren, 2010).

1.2 Basel ratio framework and disclosure requirements

An underlying cause of the global financial crisis was the build-up of excessive on- and off-balance sheet leverage in the banking system. In many cases, banks built up excessive leverage while apparently maintaining strong risk-based capital ratios. At the height of the crisis, financial markets forced the banking sector to reduce its leverage in a manner that amplified downward pressures on asset prices. This deleveraging process exacerbated the feedback loop between losses, falling bank capital and shrinking credit availability. The Basel framework introduced a simple, transparent, non-risk-based leverage ratio to act as a credible supplementary measure to the risk-based capital requirements. The Basel III leverage ratio is

defined as the capital measure (the numerator) divided by the exposure measure (the denominator). Where, Capital measure used for the leverage ratio at any point in time is the Tier 1 capital measure applying at that time under the risk-based framework. And Exposure measure for the leverage ratio should generally follow the accounting value, subject to the following two points: 1) on-balance sheet, non-derivative exposures are included in the exposure measure net of specific provisions or accounting valuation adjustments and 2) netting of loans and deposits is not allowed (Basel Committee, 2014).

1.3: Research Gap

Many of the previous studies was based on the Islamic banks and conventional banks separately. Rare of the study has been conducted for checking their mutual relationship in case of Pakistan. This study based on that the conventional and Islamic banks in Pakistan affected by capital adequacy ratio upon risk, performance and Quality management. Credit risk, Interest rate risk, Liquidity risk and Operational risk shows the risk. Return on equity, return on asset and Net interest margin shows the performance. Similarly, Customer Satisfaction and Customer Perceptions these two factors show the Quality management. In analysis gap first, we checked the impact of capital adequacy ratio on risk, performance and quality management of Islamic banking sector of Pakistan. Secondly we analysed the same impact on conventional banking sector of Pakistan. And then at the last we calculated the impact of capital adequacy ratio on risk, performance and quality management on overall banking sector (Islamic and conventional) of Pakistan.

1.4: Objectives of the study

Following are the objectives of study to:

- To analyse the impact of capital adequacy ratio on risk (Credit risk,) of Islamic and conventional banking sector of Pakistan.
- To evaluate the impact of capital adequacy ratio on Performance (Return on equity) of Islamic and conventional banking sector of Pakistan.
- To analyze the impact of capital adequacy on Quality management of Islamic and conventional banking sector of Pakistan.
- To compare the Islamic and conventional banking sector of Pakistan

1.5: Research question

- What is the impact of capital adequacy ratio on risk (Credit risk)?
- What is the impact of capital adequacy ratio on performance (Return on equity)?

1.6: Research hypothesis

- **H_0:** Capital adequacy ratio have no impact on risk and performance in Islamic and commercial banks.
- **H_1:** Capital adequacy ratio have impact on risk and performance in Islamic and commercial banks.

1.7: Significance of Study

In the entire world the global financial crises have raised many questions upon the financial institutions and their role in market efficiency. With the financial intermediaries commonly known as banks the movement of money is possible between the borrowers and lenders. With the assistance of banks, the capital in the economy is circulated. The financial intermediaries in Pakistan as per the rules and regulations and it tries to keep the minimal level of capital as indicated by Basel Committee is regulated by the central bank in Pakistan.

To analyze the relationship among the capital adequacy ratio and the efficiency of banks, it is very important for this purpose. Through analyzing the efficiency in overall banking sector of the country the study will be quite beneficial in adding up the value in the field of banking.

In this chapter first, we discuss the historical background of our study which is based on the financial crisis and its impact on banking sector of Pakistan. In chapter 2, we explain and site the many previous and current studies to evaluate our study. In 3rd chapter we explain the general model of our study. In chapter 4 we explain the results of summary statistics, correlation matrix, endogeneity test, random effect model test and Three stage least square method for Islamic banking sector, conventional banking sector and for both (Islamic, conventional) banking sector of Pakistan. Chapter 5 includes conclusion, policy recommendations and study limitations.

Chapter # 2

Literature Review

The relationship between efficiency of Banks and capital and the risk we found many of the studies on this relationship. But rare of the study we found that on the relationship between efficiency and capital adequacy ratios. We found that Islamic banks characteristics were reviewed by comparing the Islamic finance to conventional banks in early studies. The comparison between Islamic banks and conventional banks and success and development of Islamic banks we also found in early studies. It grab the attention of many researchers due to the success of Islamic banks and potential of Islamic banking. Profits, risks and efficiency were the factors used by researchers to compare Islamic commercial Banks with conventional commercial Banks we found that in recent studies.

2.1: Theoretical Background

Sanyaolu et al, (2020) Explained that the buffer theory of capital adequacy highlights the importance of having capital above the stipulated requirements to reduce risk. The capital structure of most banks in Nigeria is over and above the specified requirements. However, the banks who breach the minimum capital requirement are punished severely, which is inclusive of monetary penalties and revocation of operating licenses. Many banks in a highly volatile economy maintain a buffer capital. This buffer capital allows the banks to meet unwarranted short term obligations and meet the statuary capital requirements. Many poorly managed banks invest in ventures that are contrary to prudential regulations. These ventures in the short term might enhance the capital structure, but in the long run, it is disastrous for the bank and general public.

Ahmad and Albaity (2019) explored that the moral hazard theory of capital adequacy implies that sometimes decision-makers prefer to take sub-optimal decisions in the short term, especially when such choices lead to private benefits. This situation is common in countries where accountability is low. The moral hazard theory of capital adequacy suggests that bank managers' opportunistic behavior is likely to affect depositors and shareholders negatively. This situation arises when there is information asymmetry, and bank managers possess information which other parties are not privy to. Undercapitalized banks that select risky asset portfolios against the deposit insurance system is termed resurrection by gambling.

Prospect theory, Kahneman and Tversky (1979, 1992) described that prospect theory is a highly influential theory of decision-making under risk. In a parsimonious way, it captures a wide range of experimental evidence on attitudes to risk. As such, it has the potential to shed light on asset prices and investor behavior. However, despite years of effort, we still do not understand its implications for some basic aspects of asset prices, such as the cross-section of average returns. Prospect theory posits that people evaluate risk using a utility function that is defined over gains and losses; that has a kink at its origin, capturing a greater sensitivity to losses than to gains (loss aversion) and that is concave over gains and convex over losses, capturing risk aversion over moderate-probability gains and risk-seeking over moderate-probability losses (diminishing sensitivity).

Piotr (2018) stated that Agency theory refers to a contract in which one party, the principal, engages the other party, the agent, to provide services on the principal's behalf. If the preferences of the contracting parties are contradictory, and in addition, there is an asymmetry of information, this may lead to uncertainty about the implementation of the contract. Herein lies the concept of the 'agency problem'. The key issue is to describe the mechanisms which could bring the parties' preferences closer to each other and mitigate

potential conflicts of interest. The Principal-Agent framework was a concept used primarily to describe and processes taking place in the context of corporate governance. However, the theory is also being used to describe the processes associated with the functioning of the higher education system. Contractual relationships in this sector make it possible to identify the institutions that may act as either principal or agent, depending on the research perspective.

Dividend Irrelevance theory declared by Modigliani and Miller in (1961) suggested that a firm's choice of dividend policy has no impact on shareholders wealth because the value of the firm depends on its earnings and investment strategy and not the way the earnings are distributed. Based on assumptions of perfect capital market conditions where the cost of buying and selling stocks and taxes does not exist, that all investors have equal information pattern and managers would work in the best interest of the firm. They reinforced the dividend irrelevance theorem by arguing that if the dividend practice adopted by any firm corresponds to the dividend preference of its shareholders each firm would attract its clientele based on its dividend policy practice.

The signaling theory suggested by Linter (1956) is derived from the level of information asymmetry between managers and investors' dividend changes convey information about the firm's prospects. Linter noted that managers are more willing to raise rather than reduce dividend levels, and this is construed to mean that dividend decreases are associated with negative signals while dividend increases signal positive news.

Bird in Hand theory explained by Easterbrook (1984) argued that the risk of the firm is determined by the nature of the investments and not how the investments are financed. Investors can lower their risk by reinvesting their income in the same firm or other better firms, therefore, reducing their risk.

The differences between conventional and Islamic banking, and in addition the success and development of Islamic banks many of the past studies are related like these studies. Due to quick development and success of this banking system many researchers attract towards the Islamic banking. To maintain capital adequacy ratio according to the required minimum ratio fixed by the (BIS) bank of international settlements, it is mandatory for banks in banking industry said by Burger in (1995). To give solid impression in market and to stakeholder's banks usually try to maintain high capital adequacy ratio. Banks are advised to maintain high capital requirement, for the fulfillment of high capital requirement banks usually take loans which results money downturn and if banks are not able to fulfill the required capital level they decrease their credit supply and other financing activities for decreasing lending activities showed by many of the previous studies. Should not have any effect on the overall cost of funds for banks on composition of a banks liabilities and credit supply it is said by Modigliani-Miller in (1958).

In (1995) Gertler and Bernanke found that the theoretical credit collapse. After the US recession work on capital requirements on bank lending was developed it was noticed that in 1990s early (Bernanke, 1995). The fifteen European countries period from year 1992 to 2000 those banks that bear low risk as their capital increase faces inefficiency it is showed by the data Altunbas et al, (2007). There is a positive relationship between Capital and efficiency. The efficiency of banks ascertains the level of risk and capital it is concluded by Hughes (1998). The correlation between efficiency, capital and risk-taking behavior of banks working in Albania during the period from year 2002 to 2014 it is investigated by Mosko, Aida, Bozdo, Anilda (2015). There is a positive and significant tradeoff between inefficiency and bank risk-taking (American banks evidence) and a negative one (European banks evidence) seem to hold more capital and take less risk in case of inefficiency it is cleared by the results.

The efficiency of bank and capital influences bank's risk it is explained by Berger, De Young, Kwan and Eisenbeis in (1997). There would be no likelihood of financial failure if the higher capital ratios, the high increase in risk. There is a negative relationship between capital and risk founded by Dahl and Shrives in (1992). When depositors are insured with a flat premium then risk appears. Reasonable capital requirement could diminish higher risk consequently. It is concluded by Miah and sharmeen in (2015) the cost management is done efficiently by the conventional commercial bank and they examined the related among efficiency, capital and risk through the data collection from the banks for 10 years i.e. 2001 to 2011 in Bangladesh. The observed that there is a bidirectional and positive relationship among the risk and capital in Islamic banks, but the conventional banks hold negative relationship. It is analyzed through mixed results that are mentioned above in case of banks Capital efficiency and risk have casual direct relationship among them. These are some other factors include agency issues, ownership structure, asymmetrical information and moral hazard which may cause the dependent.

Ayub (2012) concluded that Islamic banking and finance is now a piece of the global finance. According to Errico and Farahbaksh (1998) Basel Accord has no difference between conventional and Islamic financial institutions for capital requirements. Rajhi (2012) explained that in the world, the literature exhibited that the Islamic banks are the best-capitalized banks. In (2015) Ayub stated that 22 Islamic banks now have US $ 1b or more in shareholder equity with Capital Adequacy Ratio (CAR) between 14 and 26 globally. Bashir and Hassan (2004) held that under Basel-III, Islamic banks have better capital asset ratio and demand lesser risk-weighted assets (RWA) than the commercial banks. The trading book business and short selling are forbidding in Islamic banking. Harzi (2012) narrated that Islamic banks do not hold in their portfolios 5 and the major part of the additional RWA in Basel-III is linked to such instruments.

Islamic banks are better capitalized owing to requirement of Shariah compliance and holding large capital under Tier 1, it is explained by Kara in (2011). Boumediene (2011) said that deposit insurance is not needed, and it decreases the cost of financing because Islamic bank's sources of financing comprise of own capital, demand deposits and profit-sharing investment.

For conventional banks there are many previous studies for the implication of Basel accord on lending practices. In the context of Basel Accord II few studies have been done as Ismail (2009), where he indicated that Malaysian Islamic banks reduced their volume of financing to expand their capital ratios. By lessening their riskier assets and shifting to 20% risk-weighted category from higher risk categories Malaysian Islamic banks effectively increased their capital ratios. The relationship between capital requirements and loan growth in Islamic and conventional banks of four OIC countries from the period 1999 to 2009 by using panel data technique of Generalized Least Square (GLS) with fixed effect model it is Examined by the Karim et al in 2014. There is a strong positive relationship among capital requirements and loan growth for both Islamic and conventional banks founded in this study. To credit crunch to reduce their risk assets in line with the capital adequacy ratio those banks who cannot meet Basel Accord. Bank size in all equations has a positive and significant impact. Thus, large banks have more opportunities to invest, consistent with the diversification hypothesis (Zhang et al. 2008).

Bank of International Settlements (BIS) has set the minimum ratio which the banks have to follow regarding the capital adequacy requirement specifically. Berger (1995) narrated that despite that, banks optimally increase their capital adequacy ratios to remains flexible and sound for their stakeholders. Hassan (2001) depicted that the performance of Islamic banks during 1994-2001. To comprehend profitability and the result showed that high capital results in high profitability different internal and external banking characteristics were

utilized. Capital adequacy have negative impact on banks Performance it is argued that from other studies.

Islamic commercial banks outperformed rather than conventional commercial banks it is found by Iqbal in 2011. Brown et al, (2007) observed that the Islamic commercial banks have higher increase in capital and efficiency as compare to the conventional commercial banks in those countries where dual banking system had been followed. In achieving economies of scale as compare to the conventional banks Islamic banks are relatively new as compare to the conventional banks. They are superior if they charge the same rates to their customers as conventional banks charges.

In Malaysia Islamic Banks are superior to conventional banks on competency basis proved by the two studies Serder et al. (2011), and Mokhtar et al. (2006). Many other studies explained the relationship between efficiency, capital and risk. The overall portfolio risk can be reduced by following regulatory capital requirements explored by Kahane (1977). By regulator by weighting the asset with risk the excessive risk-taking of the banking portfolio can be reduce. The weighting system of the risky assets Portfolio approach further extended stated that b Kim and Santomero (1988). (Rochet 1992, Koehn & Santomero, 1980, and Kim & Santomero 1988) explained that the portfolio choices of commercial banks with respect to the consequences of capital regulations. It is concluded that banks can go for risky portfolios despite of capital regulations if bank's goal is to maximize its market value and to increase their future profits.

The amount of capital a bank retains compared to its risk measured by the capital adequacy ratio (CAR) . To determine how effectively it can sustain a reasonable amount of loss national regulators must track the CAR of banks. If a bank's current CAR is compliant with statutory capital regulations it is also determined by the National regulators. It is an

important measure of the financial soundness of a bank and CAR also important for shareholders.

To examine the liquidity (LQD) determinants of Indian listed commercial banks Chowdhury and Rasid (2017) and Masood and Ashraf (2012) and A. Al-Homaidi *et al.* (2019) has used the panel data structure model. There are both effects random and fixed effects models by applied both GMM and pooled. To reduce Heteroscedasticity probability and makes log transform of these variables Binh and Thomas (2014) has examined the effects of several independent variables on banks' adequate capital by applying the regression on dependent variables based on three ways: Pooled Regression, Fixed Effect Model, and Random Effect Model. The Correlated Random Effects Haussmann Test was performed in order to examine which of these two models is more appropriate. To examine the factor influencing Japan regional bank's capital adequacy ratio and its effect on financial position and economic level by using secondary data Yahya *et al.* (2015) has applied Panel data regression methodology. To determine the impact of Capital Adequacy Ratio on bank's lending and deposit behavior and on the importance of maintaining certain level of capital reserve Saba *et al.* (2018) has applied panel data methodology. By using a simultaneous equations model Rime (2001) examined the relationship between risk and capital in commercial banks. To assess the relationship between capital, efficiency and risk for a sample of European commercial banks Fiordelisi *et al.* (2011) has used Granger-causality technique.

Various studies used 2SLS or 3SLS for analysis because Ordinary least squares (OLS) are not appropriate for estimating simultaneous equation systems since equations' error terms generally correlate with the endogenous variables included in each equation as explanatory variables. In a panel data framework Tan and Floros (2013) examined the relationship between bank efficiency, risk and capital for a sample of Chinese commercial banks

employing three-stage least square method. In order to investigate the reactions of Tunisian commercial banks to regulatory pressure in terms of capital and risk decisions Bouheni and Rachdi (2015) has estimated a simultaneous equation model by using 3SLS. On risk-taking behavior of banks in Pakistan, co-integration test and dynamic ordinary least square (DOLS) and the two-step system generalized method of moments has applied for estimation Rashid and Khalid (2018) has examined the empirical impacts of capital-level.

Chapter # 3

Data and Methodology

3.1. Introduction

The researcher has used in carrying out the research in this chapter provides a description of the procedures and methods. This chapter depends on the research objectives laid down in chapter one. Study population, population sampling method, data collection methods and instruments and also data analysis and reporting methods covered by methodology.

3.2: General Model

$$RISK = F\ (CAR, PER, QM, SIZE) \qquad (1)$$

$$QM = F\ (CAR, PER, RISK, SIZE) \qquad (2)$$

$$PER = F\ (CAR, RISK, QM, SIZE) \qquad (3)$$

3.3: What is Simultaneous Equation model?

A set of linear simultaneous equations called the Simultaneous Equation Model (SEM). SEM models have two or more equations, where introductory regression analysis introduces models with a single equation (e.g. simple linear regression). Changes in

the response variable (Y) happen because of changes in the explanatory variable (X); in an SEM model, other Y variables are among the explanatory variables in each SEM equation in a single-equation model. The system exhibits some type of simultaneity or "back and forth" causation between the X and Y variables, in other words, the system is jointly determined by the equations in the system.

3.4: Variables and its structure

Sr. no.	Variable name	Measurement	Take as	Reference
1	Capital adequacy ratio	Measured by total Capital/Risk Weighted Assets	Independent variable	Ikpefan, O. A. (2013). Capital adequacy, management and performance in the Nigerian commercial bank (1986-2006).
2	Risk -Credit risk	-Measured by Non-performing loans/Total loans.	Dependent variable	Hassan, M. K., Unsal, O., & Tamer, H. E. (2016). Risk management and capital adequacy in Turkish participation and conventional banks:
3	Performance -Return on equity.	-Measured by Net profit/Total equity.	Dependent variable	Mathuva, D. M. (2009). Capital adequacy, cost income ratio and the performance of commercial banks: The Kenyan Scenario.
4	Quality management	-Customer Satisfaction -Customer Perceptions	Dependent variable	Rod, M., Ashill, N. J., & Gibbs, T. (2016). Customer perceptions of frontline employee service delivery: A study of Russian bank customer satisfaction and behavioral intentions.

5	Size	Bank size (Size): Natural Logarithm of total assets as at the end of each fiscal year.	Control variable	Bouheni and Rachdi (2015), Bank Capital Adequacy Requirements And Risk-Taking Behavior In Tunisia: A Simultaneous Equations Framework

3.5: Presentation of Empirical Model

On risk and performance many researchers use different methods to analyze impact of CAR. We use simultaneous equation model in this study. OLS is not applicable due to problem of endogeneity therefore in simultaneous equation model 3SLS will be applied to resolve this problem.

The aim of this study is to analyze the impact of capital adequacy ratio on risk and performance of Pakistani banks. To this end, we estimate the following system equation:

Risk equation

$$Risk_{it} = \alpha_i + \beta_1 CAR_{it} + \beta_2 Size_{it} + \beta_3 QM_{it} + \beta_4 P_{it} + \varepsilon_{1it} \quad (1)$$

Quality management equation

$$QM_{it} = \Upsilon_i + \delta_1 CAR_{it} + \delta_2 Size_{it} + \delta_3 Risk_{it} + \delta_4 P_{it} + \varepsilon_{2it} \quad (2)$$

Performance equation

$$P_{it} = \varphi_i + \omega_1 CAR_{it} + \omega_2 Size_{it} + \omega_3 Risk_{it} + \omega_4 QM_{it} + \varepsilon_{3it} \quad (3)$$

The detail about descriptions of various variables is as follows:

CAR = Capital Adequacy Ratio

Risk = Risk (Credit risk, Interest rate risk, Liquidity risk and Operational risk)

Size = Bank Size (total assets end of fiscal year)

QM = Quality management (Customer Satisfaction and Customer Perceptions)

P = Performance (Return on equity, Return on asset and Net interest margin)

Where: -

i. subscripts i denotes individual 11 banks (Allied Bank Limited, Bank Al-Habib Limited, Habib Bank Limited, MCB Bank Limited, MCB Islamic Bank Limited, Meezan Bank Limited, National Bank of Pakistan, United Bank Limited, Zarai Taraqiati Bank Limited, Bank of Khyber, Bank of Azad Jammu & Kashmir).

ii. t denotes time period (t = 2000, 2018).

iii. β, δ and ω are the slope parameters to be estimated.

iv. $\mathcal{E}$ is the error term.

v. α,γ, φ are constant parameters.

Equations' error terms generally correlate with the endogenous variables included in each equation as explanatory variables so, ordinary least squares (OLS) are not appropriate for estimating simultaneous equation systems because these variables have endogeneity problem usually. Then we used 3SLS, methodology which provides consistent parameter estimates the endogeneity of capital and risk adjustments is recognized by the three-stage least squares (3SLS). We also use 2SLS in case of endogeneity problem however, the simultaneous equation model is estimated using the 3SLS procedure which admits endogeneity of variables according to Aggarwal and Jacques (2001). It is a well-information estimator and produces parameter estimates more asymptotically and more efficient than those of 2SLS so 3SLS provides consistent estimates of parameters.

By using the Durbin-Wu-Hausman test we test endogeneity of Risk, QM and P firstly. To resolve endogeneity bias, we use the first risk lag in the first equation and QM in the second

equation and P in the third equation if this test confirms the endogeneity among the variables at P-value equals 5% significance level.

3.6: What is control variable?

As an independent variable, a control variable enters a regression in the same way, the method is the same. Control variables are related to the dependent variable but usually you are not particularly interested in but also these variables are different in interpretation. Suppose, for example, you were interested in the difference in height of people from different ethnic groups if you want to remove their effects from the equation. You could measure them and compare the heights after gathered a sample of people from different ethnic groups. Some other variables that are known to relate to height (e.g. sex) you'd probably want to control. Men are taller than women it is known as. The sample from each group will not have the same proportion of men and women, so you want to add that as a variable even if your samples are random. Mediator is a one kind of control variable. You want to control for the size of the fire, if you are interested in the relationship between the number of firemen and the amount of damage.

3.7: What is Three Stage Least Square (3SLS) Method?

The term three-stage least squares (3SLS) sometimes known as seemingly unrelated regression (SUR), with two-stage least squares estimation refers to a method of estimation that combines system equation. Each equation of the system is at least just identified, it is assumed. 3SLS is a set of nonlinear equations obtains three stage least squares estimate. 3SLS is a special case of LSQ with a set of equations. A more complete description of the command is LSQ entry. 3SLS estimates are under some conditions, asymptotically more efficient, consistent and asymptotically normal than single equation estimates. Generally, the model is linear in the parameters and endogenous variables 3SLS is asymptotically less efficient than FIML.

3.7.1: Usage

The combination of multivariate regression (SUR estimation) and two stage least squares is called three stage least squares (3SLS). Taking into account the covariance's across equation disturbances as well as it obtains instrumental variable estimates. The sum of squared transformed fitted residuals is the objective function for three stage least squares. Except that the INST list is required, the Specification of the LSQ command is same for the 3SLS command. To instrument all the equations, the variables in the INST list will be used so that the actual instrumental variable matrix has the form given by Jorgenson and Laffont (1975), rather than that given by Amemiya (1977). A variable cannot be exogenous to one equation and endogenous to another, in a simultaneous equations model.

3.7.2: Method

With cross-equation constraints imposed, but with a diagonal covariance matrix of the disturbances across equations, and also constrained two stage least squares estimator, three stage least squares estimates are obtained by estimating a set of nonlinear (or linear) equations. When the model is re-estimated to obtain new values of the parameters the parameter estimates thus obtained are used to form a consistent estimate of the covariance matrix of the disturbances, which is then used as a weighting matrix. The actual method of parameter estimation described under LSQ, is the Gauss-Newton method for nonlinear least squares. Only two iterations will be required, one to obtain the covariance matrix estimate, and one to obtain parameter estimates if the model is linear in the parameters and endogenous variables.

3.8: Data and Sample

To examine the impact of capital adequacy ratio on risk and performance and on quality management. First we will examine the impact of impact of capital adequacy ratio on risk and performance and on quality management on the Islamic banking sector of Pakistan and then analyze the impact of capital adequacy ratio on risk and performance and on quality management on conventional banking sector of Pakistan. After this we will check the impact of capital adequacy ratio on risk and performance and on quality management on both Islamic and conventional banking sector of Pakistan. The analysis based on secondary data from period 2000 to 2019. To analyze macroeconomics variable data has taken from the official website of World Bank, the data has taken from the financial statements of the websites of those banks.

There are the names of Conventional and Islamic banks which are used for data analysis Given below:

3.9: Conventional commercial banks

Askari bank, Allied bank limited, Bank Alfalah, Bank Al Habib, Faysal Bank, Habib bank, JS bank, Soneri bank, Summit bank, MCB bank and United bank limited.

3.10: Islamic banks

Meezan bank limited, Dubai Islamic bank, Al Barakah bank, Bank Alfalah Islamic, Bank Islami Pakistan and Allied Islamic bank.

Chapter # 4

Results and discussion

In this chapter we will discuss the empirical results of the impact of capital adequacy ratio on risk and performance by employing the econometrical techniques as explained in previous chapter. For comparison we will analyze both conventional and Islamic banks. First, we will check the endogeneity test because in simultaneous equations system ordinary least squares are not appropriate. Durbin Wu Hausman test will be used to check the problem of endogeneity. Secondly, we will apply three stage least square method on simultaneous equation system to see the impact of capital adequacy ratio on risk and performance.

4.1: Estimation of Islamic banks

4.1.1: Descriptive statistics

Variables	Obs	Mean	Std.Dev	Skewness	Kurtosis

Risk	160	0.0387	0.079	0.4	2.1
performance	160	0.0926	0.381	0.27	2.8
Quality	160	0.1476	0.0079	1.02	3.1
Capital AR	160	0.1322	0.0021	0.23	3.02
Size	160	0.2468	0.0026	1.1	3.01

Table 4.1: Explanation of Descriptive Statistics

Table 4.1 described the summary statistics i.e. mean, standard deviation, skewness and kurtosis of all variables (dependent, independent and instrumental variables) include in the model. Where the described value of mean for capital adequacy ratio is 13 % and standard deviation is 0.21% for the entire period of twenty years. Whereas the mean value of size of total assets is 24 % and standard deviation is 0.26% for the entire period of twenty years. The values of skewness and kurtosis in table 4.1 showed that showed that all the variables are almost asymmetrical and normality of the data.

4.1.2: Correlation matrix

Variables	**Risk**	**Capital AR**	**Performance**	**Quality**	**Size**
Risk	1.0000				
Capital AR	-0.2899	1.0000			
Performance	0.2072	-0.1617	1.0000		
Quality	0.3664	-0.3483	0.1374	1.0000	
Size	0.2865	-0.3324	0.1694	0.6389	1.0000

Table 4.2: Explanation of Correlation Matrix

Further in the analysis the explanatory variables are tested for multicollinearity based on correlation matrix. In table 4.2 the values of correlation coefficients of all variables are less than 0.7. Therefore, it is concluded that there has no problem of multicollinearity in the model of Islamic banking.

4.1.3: Endogeneity test

In the estimation of Islamic banks, we have three independent variables risk, return on equity and quality management. In simultaneous equations system there is a problem of endogeneity because the independent variables (endogenous variable) are used as explanatory variable (exogenous variable) in other equation so, there is need to identify the problem of endogeneity.

Endogeneity Test	
Ho: Variables are Exogenous	
Durbin (score) chi2(1)	6.23622 (p = 0.0125)
Wu-Hausman F (1,237)	4.26892 (p =0.1630)

Table 4.3: Explanation of Endogeneity Test

H_0: Error term is correlated with endogenous variables.

H_A: There is no correlation between error term and endogenous variables.

The probability value of Hausman test is greater than 0.05 so, we cannot reject the null hypothesis. Ordinary least square (OLS) is not suitable for simultaneous equation system as endogenous variables are included in each equation as explanatory variable then error term generally correlates with the endogenous variables. In this study the endogeneity of risk,

performance and quality management adjustments is explained by two stage least squares (3SLS) methodology which provides consistent parameter estimates.

4.1.4: Random effect test

We used panel data to recognize the impact of capital adequacy ratio on risk and quality. As panel data contains both cross section data and time series that's why we must check the cross section random effect and period fixed effects. For the identification of fixed effect and random effect we used Hausman test.

Random effect:

Correlated Random Effects - Hausman Test

Chi- Sq Statistics	Chi- Sq D.F.	Prob. Value
28.390061	4	0.102

Table 4.4: Explanation of Random Effect Test

H_0: Random effect model is appropriate.

H_A: Fixed effect model is appropriate.

Random effect test P-value is greater than 0.05 so we cannot reject the null hypothesis, and in our model, random effect is appropriate in the analysis of Islamic banks.

As Hausman test confirms the endogeneity of endogenous variables to resolve the endogeneity bias we will use the first lag of risk in 1^{st} equation, and first lags of quality management and performance in equation 2^{nd} and 3^{rd} respectively.

4.1.5: Three stage least square method

For robustness check simultaneous equation model was estimated by using the three stage least square (3sls) method. As Hausman test confirmed endogeneity in risk, performance and quality management. Three stage least square (3sls) regression provides consistent estimates of parameters because it provides well information estimator and generates parameter estimates more asymptotically and it provides more efficient estimator than two stage least square method (2sls). The Hausman test significantly confirmed the random effect estimation procedure (as the P-value of Hausman test was greater than 5%) in table 4.1.

Credit Risk		
Variables	**Coefficients**	**Prob. Value**
Capital adequacy ratio	-.037779	0.160
Return on equity	.0776674	0.000
Quality management	1.022308	0.000
Size Total assets	-6.091110	0.000
_cons	.0228541	0.100
R square		0.1597
Return on equity		
Variables	**Coefficients**	**Prob. Value**
Capital adequacy ratio	-.1138803	0.428
Credit risk	2.173614	0.000
Quality management	-3.123408	0.000
Size Total assets	2.064509	0.000
_cons	.0200715	0.678
R square		0.0308
Quality management		
Variables	**Coefficients**	**Prob. Value**
Capital adequacy ratio	-1.1807388	0.917

Credit risk	4.164307	0.000
Return on Equity	-4.526457	0.000
Size Total assets	.0625708	0.000
_cons	-5.092648	0.381
R square		0.9324

Table 4.5: Explanation of Three Stage Least Square Method

Table 4.2 showed the three stage least square method which describes that in 3SLS instrumental variables are statistically significant and signs are according to the theory. Capital adequacy ratio, size, return on equity and quality management are significant in risk equation as the endogenous variables have endogeneity problem and too resolve the problem of endogeneity, we introduced the first lag all dependent variables (credit risk, return on equity and quality management).

We observed that in Islamic banking system the impact of capital adequacy ratio on risk is negative. Which means that capital requirement increases the capital adequacy ratio (CAR) but banks did not reduce their risk. In risk equation banks size have a negative impact on risk. It means that larger the bank size more they manage their risk. In this study capital adequacy ratio was measured by total capital weighted assets.

The performance of Islamic banks was measured by return on equity. Capital adequacy ratio has a negative impact on performance, which means that increase in return on equity lead to improve in capital adequacy ratio. In performance equation size of total assets have a positive impact on performance which means that as size of total assets increases it will improve the performance of Islamic banks.

In Islamic banks capital adequacy ratio has a negative impact on quality management which means that an increase in capital adequacy ratio the banks will develop and improve its service relationship with costumers. Size of total assets have a positive impact on quality management which means that an increase in size of total assets will improve the quality management of Islamic banks.

4.2: Estimations of conventional banks

4.2.1: Descriptive statistics

Variables	Obs	Mean	Std.Dev	Skewness	Kurtosis
Risk	180	0.0956	0.079	1.002	2.7
performance	180	0.3513	0.381	0.11	3.01
Quality	180	0.0111	0.0079	0.88	2.24
Capital AR	180	0.1794	0.0029	0.79	2.10
Size	180	0.0775	0.0049	0.12	2.4

Table 4.6: Explanation of Descriptive Statistics

Table 4.6 showed the summary statistics of commercial banks i.e. mean, standard deviation, skewness and kurtosis of all variables (dependent, independent and instrumental variables) include in the model. Where the described value of mean for capital adequacy ratio is 17 % and standard deviation is 0.29% for the entire period of twenty years. Whereas the mean value of size of total assets is 7 % and standard deviation is 0.49% for the entire period of twenty years. The values of skewness and kurtosis in table 4.1 showed that showed that all the variables are almost asymmetrical and normality of the data.

4.2.2: Correlation matrix

Variables	Risk	Capital AR	Performance	Quality	Size
Risk	1.0000				
Capital AR	-0.2286	1.0000			
Performance	-0.0308	-0.0840	1.0000		
Quality	0.3664	-0.1584	-0.0371	1.0000	
Size	0.0908	-0.0876	-0.0148	0.0770	1.0000

Table 4.7: Explanation of Correlation Matrix

Further in the analysis of commercial banks the explanatory variables are tested for multicollinearity based on correlation matrix. In table 4.7 the values of correlation coefficients of all variables are less than 0.7. Therefore, it is concluded that there has no problem of multicollinearity in the model of conventional banks.

4.2.3: Endogeneity test

In the estimation of conventional commercial banks, we have three independent variables risk, return on equity and quality management. In simultaneous equations system there is a problem of endogeneity because the independent variables (endogenous variable) are used as explanatory variable (exogenous variable) in other equation so, there is need to identify the problem of endogeneity.

Endogeneity Test	
Ho: Variables are Exogenous	
Durbin (score) chi2(1)	3.96622 (p = 0.2128)
Wu-Hausman F (1,91)	2.37482 (p =0.3129)

Table 4.8: Explanation of Endogeneity Test

The probability value of Hausman test is greater than 0.05 so, we cannot reject the null hypothesis. Ordinary least square (OLS) is not suitable for simultaneous equation system as endogenous variables are included in each equation as explanatory variable then error term generally correlates with the endogenous variables. In this study the endogeneity of risk, performance and quality management adjustments is explained by two stage least squares (3SLS) methodology which provides consistent parameter estimates.

4.2.4: Random effect test:

We used panel data to recognize the impact of capital adequacy ratio on risk and quality. As panel data contains both cross section data and time series that's why we must check the cross section random effect and period fixed effects. For the identification of fixed effect and random effect we used Hausman test.

Random Effect Model:

Correlated Random Effects - Hausman Test

Chi-Sq Statistics	Chi-Sq D.F.	Prob. Value
6.711	2	0.1349

Table 4.9: Explanation of Random Effect Test

H_0: Random effect model is appropriate.

H_A: Fixed effect model is appropriate.

Random effect test P-value is greater than 0.05 so we cannot reject the null hypothesis, and in our model, random effect is appropriate in the analysis of Islamic banks.

As Hausman test confirms the endogeneity of endogenous variables to resolve the endogeneity bias we will use the first lag of risk in 1st equation, and first lags of quality management and performance in equation 2nd and 3rd respectively.

4.2.5: Three stage least square (3SLS) Method

For robustness check simultaneous equation model was estimated by using the three stage least square (3sls) method. As Hausman test confirmed endogeneity in risk, performance and quality management. Three stage least square (3sls) regression provides consistent estimates of parameters because it provides well information estimator and generates parameter estimates more asymptotically and it provides more efficient estimator than two stage least square method (2sls). The Hausman test significantly confirmed the random effect estimation procedure (as the P-value of Hausman test was greater than 5%) in table 4.1.

Credit Risk		
Variables	**Coefficients**	**P>|Z|**
Capital adequacy ratio	2.61108	0.220
Return on equity	5.871208	0.000
Quality Management	4.700012	0.000
Size Total assets	-.0137021	0.846
_cons	-1.083208	0.109
R square		0.0357
Return on equity		
Variables	**Coefficients**	**P>|Z|**
Capital adequacy ratio	-.85606	0.000
Credit risk	2.4910	0.000
Quality Management	-2.2709	0.000
Size Total assets	-1.3611	0.768

_cons	.32953	0.000
R square		0.0389
Quality Management		
Variables	**Coefficients**	**P>|Z|**
Capital adequacy ratio	-8.3107	0.001
Credit risk	.07409	0.000
Return on equity	-7.9707	0.000
Size Total assets	.001295	0.881
_cons	3.5407	0.000
R square		0.3252

Table 4.10: Explanation of Three Stage least Square (3SLS) Method

In table 4.3 we observed that in conventional commercial banks the impact of capital adequacy ratio on risk is positive and significant. Which means that capital requirement increases the capital adequacy ratio (CAR) and pushes banks to reduce their risk. In risk equation banks size have a negative impact on risk. It means that larger the bank size more they manage their risk. Hence, an increase in the capital level will decrease in bank risk-taking. This result is confirmed by the findings of (Hughes, 1998) who discovers that the efficiency of banks ascertains the level of risk and capital. Berger et al. (1997) concluded that performance of bank and capital influences bank's risk. The higher capital ratios, the high increase in risk and there would be no possibility of financial failure. (Dahl and Shrives, 1992) found negative relationship between capital and risk. Risk appears when depositors are insured with a flat premium. As a result, it can be concluded that reasonable capital requirement could diminish higher risk.

Capital adequacy ratio showed a negative impact on quality management. Increase in capital adequacy ratio the bank will develop improvements and service relationships with customers. Miah and sharmeen (2015) examined the related among efficiency, capital and risk in Bangladesh. They concluded that the cost management is done efficiently by the conventional commercial bank. The relationship among the risk and capital in Islamic banks is positive and bidirectional. But the conventional banks hold negative relationship.

In commercial banks capital adequacy ratio showed a negative impact on performance. Altunbas (2007) showed that return on assets may lead to an improvement in capital ratios and banks relying on asset returns to improve their capital instead of investing in other activities, particularly securitization, contrary to Zhang et al. (2008) who found a negative relationship between bank size and its capitalization.

4.3: Estimation of Three Stage Least Square Method for Islamic and conventional banks

Credit Risk		
Variables	**Coefficients**	**P>|Z|**
Capital adequacy ratio	4.7207	0.271
Return on equity	8.2507	0.001
Quality Management	3.9876	0.000
Size Total assets	-.20356	0.000
_cons	-43123	0.743
R square		0.0357
Return on Equity		
Variables	**Coefficients**	**P>|Z|**
Capital adequacy ratio	-.28219	0.010
Credit Risk	5.4410	0.001

Quality Management	-1.3409	0.097
Size Total assets	1.4610	0.264
_cons	.1355139	0.000
R square		0.0389
Quality Management		
Variables	**Coefficients**	**P>|Z|**
Capital adequacy ratio	-1.3107	0.021
Credit Risk	.07751	0.000
Return on Equity	-36403	0.264
Size Total assets	.04576	0.000
_cons	72188	0.000
R square		0.3252

Table 4.11: Explanation of Three Stage Least Square Method for Islamic and Conventional banking

The main objective of this research is to establish the impact of capital adequacy ratio on risk, quality and performance in Islamic and conventional commercial banks. For the comparison of Islamic and conventional banks we performed regression analysis through three stage least square (3sls) method on both banking sector and then established a combined regression analysis. The results showed that in Islamic banking system the impact of capital adequacy ratio on risk was negative while in conventional commercial banks the impact off capital adequacy ratio was positive. Which means that raising capital is costly for Islamic banks thus they restrict their risk exposure by contracting financial activities.

Mosko et al. (2015), carried out investigation about correlation between efficiency, capital and risk-taking behavior of banks working in Albania for commercial banks during

the period from year 2002 to 2014. The results were disclosed that a positive tradeoff between inefficiency and bank risk-taking (American banks evidence) and a negative one (European banks evidence) seem to hold more capital and take less risk in case of inefficiency. Altunbas (2007) investigated that, the banks which have high capital adequacy ratio experienced in managing risk levels through diversification. Bank size in all equations has a positive and significant impact. Thus, large banks have more opportunities to invest, consistent with the diversification hypothesis (Zhang et al. 2008).

In Islamic and commercial banks capital adequacy ratio have negative impact on performance (return on equity) means that an increase in return on equity will lead to an improvement in capital adequacy ratio and the banks which relying on assets return will improve their capital ratio instead of investing in other financial activities. The results showed an inconsistent performance of banking sector as performance is insignificantly related with risk. In the era of 1990s all banks performed well, and their high efficiency score gives an evidence of their good performance. The year may reflect privatization and liberalization policy on baking sector efficiency. But after this year performance of banking sector in term of efficiency became inconsistent. In (1999) and (2001) banking sector efficiency scores were very low as compared to the world standard. The reason was obvious that in both years Pakistani banks were suffering with high political and security instability. In comparison with other banking sector, public banks performed significantly better in term of technology in (2000).

The impact of capital adequacy ratio on quality management was negative which showed that increase in the capital adequacy ratio quality management was efficiently done by both commercial and Islamic banks. As Pakistani banking sector has experienced remarkable changes over the last two decades. Financial reforms were introduced in early 1990's as liberalization and privatization were also the part of these financial reforms in late

1990's. All these changes created a healthy and competitive financial sector in the country. The regulatory authorities also played a vital role in establishing the financial sector by introducing the provident regulations and strong monitoring controls. These financial reforms also changed the ownership structure of the banking sector. In past the banking sector was denominated by public owned banks and have the maximum market share by introducing the financial reforms and privatization policy, number of private banks emerged during the last decade and market share of public banks declined significantly.

Chapter # 5

Conclusion

The purpose of this thesis was to investigate the impact of capital adequacy ratio in Pakistani commercial and Islamic banks, we studied a sample containing the largest banks in Pakistan over the period from 2000 to 2019. Many of the previous studies were based on the Islamic banks or conventional banks. This study based on the conventional and Islamic banks in Pakistan affected by capital adequacy ratio upon risk, performance and Quality management. By using the simultaneous equation model, this study concluded that in conventional commercial banks the impact of capital adequacy ratio on risk is positive and significant which indicates that an increase in bank's capitalization ratio will decreases the bank risk taking while on the other hand in Islamic banks the impact is negative which indicates that increase in the capital ratio will decrease the other financial activities to reimburse the risk hence the performance of Islamic banks was also exaggerated. If more

capital ratio is in the bank, then bank can manage their risk efficiently. Thus, large commercial banks have efficiently managed their risk than the Islamic banks.

Moreover, change in capital adequacy ratio have a negative impact on performance (return on equity) in both conventional and Islamic banks which exhibited a strong institutional and regulatory level of Pakistani banks in the era of 1990s when all banks performed well, and their high efficiency score gives an evidence of their good performance. The year after may reflect privatization and liberalization policy on baking sector efficiency. But after this year performance of banking sector in term of efficiency became inconsistent. In (1999) and (2001) banking sector efficiency scores were very low as compared to the world standard. Quality management is negatively associated with capital adequacy ratio which means that an increase in the capital adequacy ratio will increase the efficiency of the banks and the quality management was efficiently done by both commercial and Islamic banks. As Pakistani banking sector has experienced remarkable changes over the last two decades. Financial reforms were introduced in early 1990's as liberalization and privatization were also the part of these financial reforms in late 1990's. All these changes created a healthy and competitive financial sector in the country. The regulatory authorities also played a vital role in establishing the financial sector by introducing the provident regulations and strong monitoring controls. Size have also significant impact in the risk equation which indicates that the banks which have large assets more they able to manage their risk. Thus, large banks have more opportunities in managing risk levels through diversification.

5.1: Recommendations

The findings of the study recommended following policies;

- Towards meeting the capital requirements, it is recommended that Pakistani Islamic banks may need to increase the required capital under Basel-III through retained earnings or equity issues.
- Banks need to improve their financial risk management processes rather than shifting their assets portfolios to secured investments.
- Commercial and Islamic banks either need to raise capital or reduce their asset portfolio or invest in less risky government securities.
- However, raising new equity capital is costly for the banks thus, they limit their risk experience by diminishing the financing activities.
- Commercial and Islamic banks should reallocate their assets portfolio to government securities to appear as highly capitalized banks in Pakistan.
- Shift in financing behavior of banks have policy implications for the regulators to check whether strong and high capital adequacy ratio is achieved at the cost of crowding out of private sector.

5.2: Future indication

The present study emphases on the impact of capital adequacy ratio on risk and performance in Islamic and commercial banks. In future research can be taken for the development finance institutions and for non-financial sector by analyzing the same model. Moreover, this study can be extended by taking panel data of other countries.

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